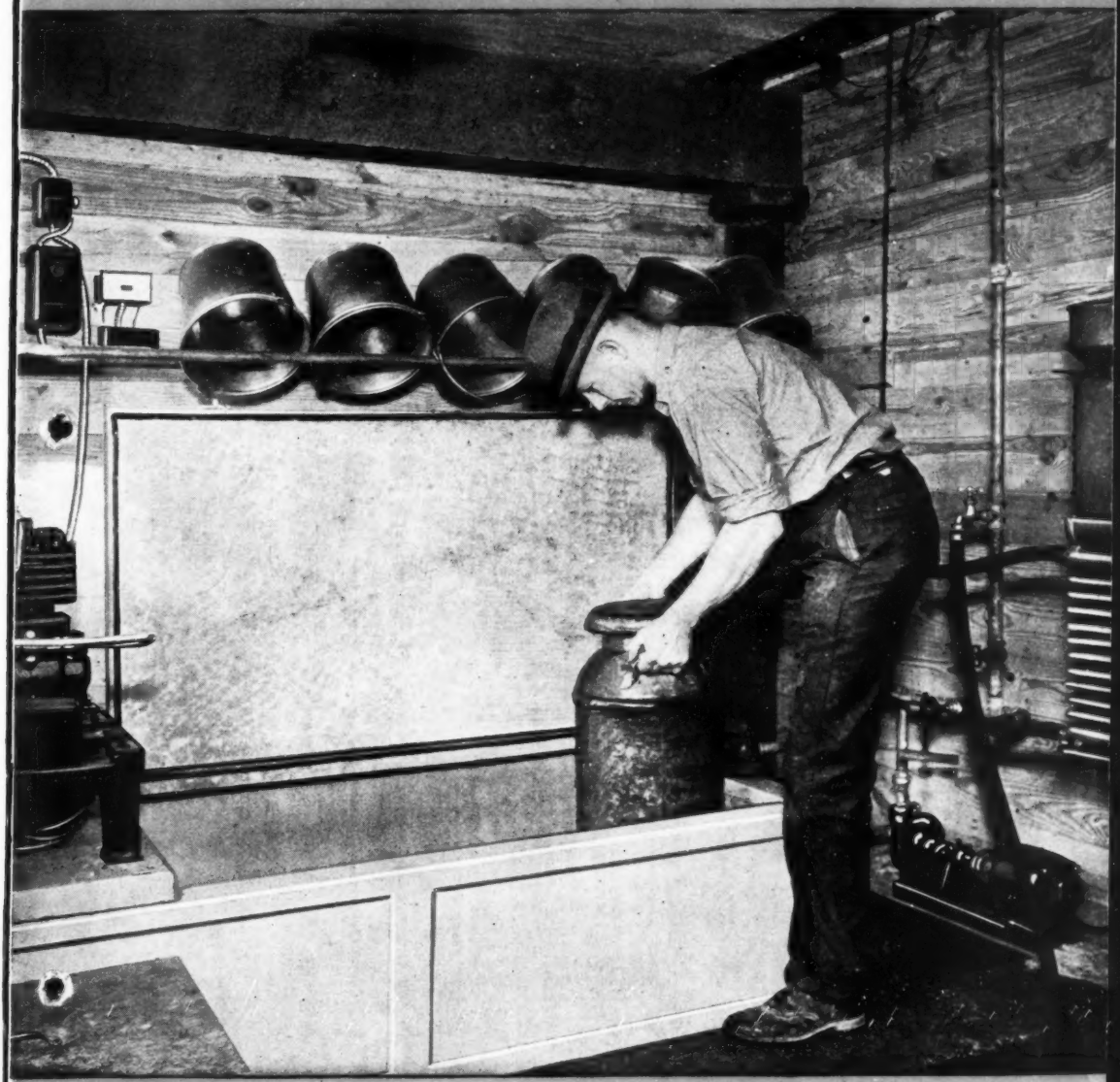
Electricity on the Farm

A MONTHLY MAGAZINE FOR THE UP-TO-DATE RURAL FAMILY



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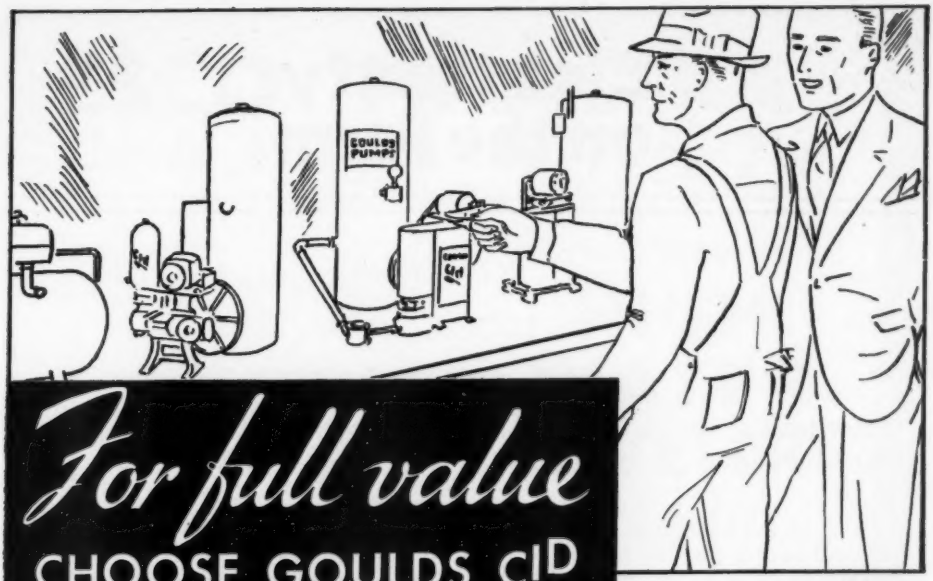

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July, 1936

Electricity on the Farm

Vol. 9, No. 7

EDITORIAL

HEAT USED TO KILL "BUGS"

One of the momentous discoveries in medical science was the relation of bacteria to human health. Before the time of Pasteur and Lord Lister, little thought was given to sanitation around the sick bed; the modes of transmission of many diseases were unknown. Water and milk borne diseases, such as typhoid fever, dysentery, cholera, etc., took tremendous toll in human lives.

Surprising though it may seem, the Chinese were probably the first people to suspect the disease-carrying ability of foods and liquids, for practically all foods in that country have, for centuries, been well cooked before eating. Tea has never been replaced by water as a beverage in many sections.

Starting with the demonstrations made by Lord Lister in England of the effectiveness of sterilizing wounds and surgical instruments, the knowledge of bacteria, particularly in so far as they affect human health, has increased rapidly. Today this knowledge is applied very effectively in checking epidemics of diseases transmitted by foods.

A direct result of the development is the present practice of sterilizing dairy utensils. And of all methods in use, electrical heat appears nearest to the ideal. It is quick, effective and the most convenient. In this issue appears an article on the subject by John E. Nicholas, Associate Professor of Agricultural Engineering at Pennsylvania State College. It reviews in an interesting manner the present status of dairy utensil sterilization in this country. Read it!

FRED SHEPPERD.

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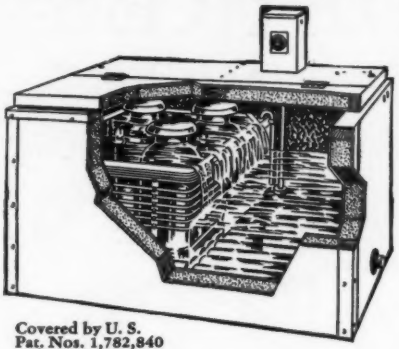

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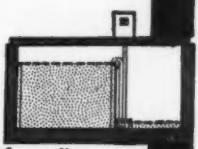
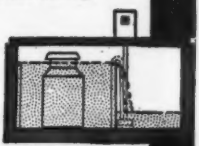
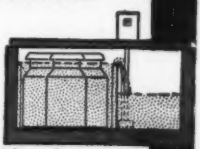


Model "A-6" ESCO "NI-AG-RA" ready to receive milk for cooling.



...Even with only 1 can in place the icy cold water is up on the neck.



Here we see the 3 cans of night milk... All are in "up to their chins" and will be cooled to below 50° in an hour.

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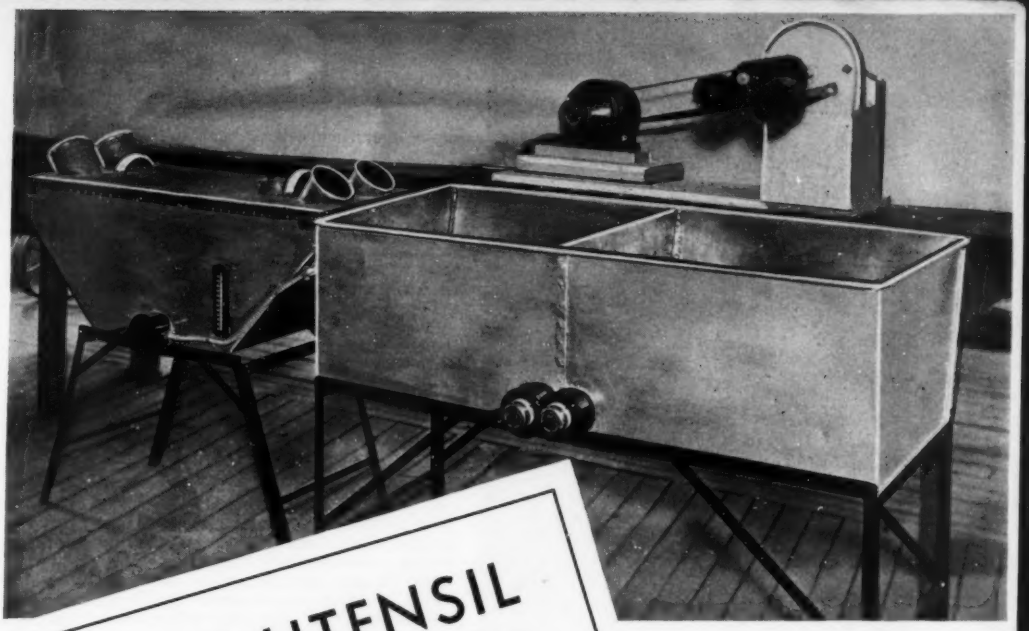


Fig. 2. An electric washing outfit for the retail dairyman. It consists of a wash vat with three-brush scrubber, a rinse vat, and a bottle sterilizer.

MILK UTENSIL STERILIZERS

By JOHN E. NICHOLAS*

THE U. S. Department of Agriculture Farmer's Bulletin No. 1473 states that "one of the greatest sources of sour milk and low grade dairy products is the unsterilized utensil. The tiny bacteria that cause souring, off-flavors, and sometimes sickness, grow very fast on the moist surfaces of unsterilized pails, strainers and cans."

The demand for better quality of milk has caused many farmers to sterilize all their milk utensils as an insurance against loss by souring or low grade. Every milk producer should be interested in supplying the market with high quality milk, first because it is good business principle and second because high quality milk has the tendency to increase the milk demand, which eventually benefits the farmer financially. Dairymen who use clean, sterilized utensils usually are the leaders in producing milk of low bacteria count.

Utensils which have not been properly washed, commonly carry large numbers of bacteria. The method of cleaning the utensils and killing the bacteria is simple. Utensils are easier to wash immediately after being used. They should first be rinsed with cold water. This helps to keep the wash water clean, reduces the amount of washing powder necessary, and prevents "cooking" the milk solids to the utensils. They should then be washed thoroughly in water as hot as the hands can stand, using a brush and washing powder—not soap or soap powder. Washing and rinsing is important. Dirty wash water which may contain many bacteria should be rinsed out of utensils with clean water, which need not be hot, but warm water is desirable. The utensil is now ready for sterilization. *Sterilization does not take the place of cleanliness.*

There is a recognized need for dairy utensil sterilization. In recent years progress has been made, particularly in the field of electric sterilizers. Many wholesale and retail dairymen all over the country are using electricity as the source of

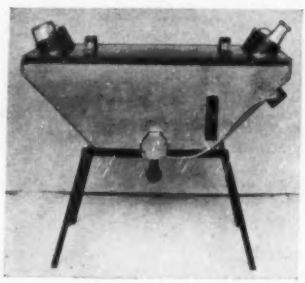


Fig. 1. Milk bottle sterilizer. It will heat the water for washing and sterilizing. The bottles pass through the tubes bottom first

*Associate Professor of Agricultural Engineering, Pennsylvania State College, State College, Pa.

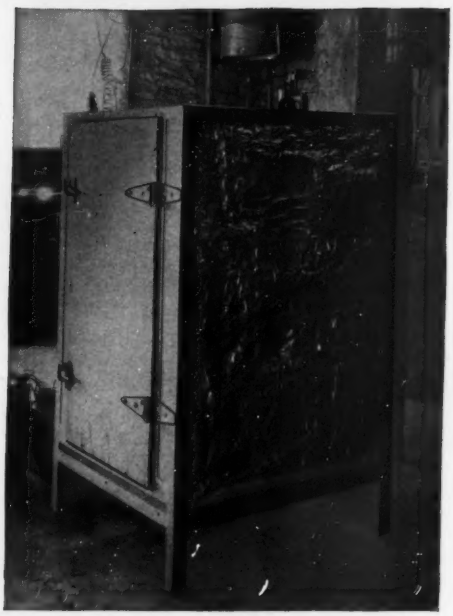


Fig. 3. (Upper) An automatic electric dairy utensil sterilizer. When the process of sterilizing is complete, the heating stops.

Fig. 4. (Lower) Electric dairy utensil sterilizer which is insulated with "aluminum foil."

heat for sterilization. City and state health authorities require sterilization of dairy utensils by heat or chemicals or both. Where the strictest sanitary rules are in force, sterilization with heat is required, and the utensils must be left dry.

Dr. Prucha was one of the first to recognize the importance of having the utensils dry after sterilization. Any moisture on the dairy utensils offers great possibility of recontamination. He pointed out that cans which had been well washed and steamed and had been held for twenty-four hours in warm weather were so abundantly supplied with germ life that, had they been filled with sterile milk, this milk would have immediately had a germ content of over 1,000,000 bacteria per c.c. and he emphasizes the fact that the main source of high germ content of milk is the utensils.

Features of Electric Sterilizers

Electric sterilizing equipment reduces fire hazard to a minimum and does away with the labor of building and keeping fires. It is easily made automatic and requires little attention. No separate boiler room is necessary and there are no odors to contaminate the milk. The absence of soot, smoke and dirt is an aid in keeping the milk house and equipment clean and in sanitary condition. When properly designed and operated electric sterilizers are economical. They require little room, are easily installed, and their operation is dependable.

Three types of electrical sterilizers are available: steam, hot water, and humidified hot air.

Steam Sterilizers

These furnish a small amount of hot water and utilize the steam-jet principle for sterilizing purposes.

The current used in "getting up steam" and sterilizing two milk pails and a strainer averages ¼ of a kw. hour. This will vary somewhat with the temperature of the water at the start and the method followed by the operator. They are only suitable for a small amount of equipment such as a producer would have who sells wholesale in cans. They would not be satisfactory for a retail bottled milk business. There are, however, large units of this same type.

Hot Water Sterilizer

Fig. 1 shows a sterilizer found to be practical in Pennsylvania and known as the Hot Water Bottle Sterilizer. It is designed primarily for the sterilization of bottles, but the top to which the bottle tubes are attached lifts off, so cans and other dairy utensils can be sterilized in the water after sterilizing the bottles. The two perforated tubes are built into the cover. It is usually equipped with a thermometer and thermostat control for maintaining temperature. With the cover in place the perforated tubes are submerged which allows the hot water to fill the bottles, as they are fed through the tubes, bottom first.

Fig. 2 shows a complete outfit for the retail dairyman. It consists of a washing and a rinsing vat and a sterilizer, with a three-brush motor driven bottle scrubber, conveniently mounted over the washing vat. The only heat required for this sterilizer is to boost the temperature to 180° F. Operated thus this sterilizer uses less than 3 K.W.H. per day for sterilizing an average of 160 bottles and 20 miscellaneous dairy utensils.

Fig. 3 shows a Humidified Hot Air Sterilizer

Fig. 6. Steam is supplied to sterilizing cabinet by a 5 Kw. electric steam boiler on the Greenwood Farm Cooperative Dairy, Winchester, Va. It also furnishes live steam for heating water.

which is an insulated cabinet equipped with space heaters. The utensils are placed in the sterilizer wet from the rinse. The door is closed and the heat turned on. The moisture clinging to the utensils provides the steam or humidified air, and the current automatically cuts off when the cabinet is hot enough. The utensils are left dry in the cabinet, ready for use when needed. This type of sterilizer cannot be used for heating wash water. It does, however, provide an excellent storage place for utensils.

Mr. Roy Strouse, a retail dairyman, R.D. 1, State College, Pa., has for the past three years been sterilizing all his utensils with an electric sterilizer like the one shown in Fig. 3. He says, "My average bacteria count for the year 1934 was 1900, while for the year 1935 it averaged 2050 and the lowest I've had this year was 1500 per c.c."

Mr. Strouse sterilizes twice a day. The average heating time is approximately ¾ of an hour. He first washes the utensils with a good stiff brush in fairly warm water, using accepted wash powder, and after rinsing them, fills the box and closes the door, ready for sterilization. By pushing the button on top of the thermostat, he starts the heating, and when the proper temperature has been attained, the thermostat automatically cuts off the current. The utensils are left in the sterilizer until they are needed at the next milking. This has the advantage of keeping all the utensils in a clean and sanitary atmosphere, free from flies and other sources of contamination. When the utensils are taken out they are entirely dry, which is one of the essential requirements for adequate sterilization.

This type of sterilizer is automatic. When the process of sterilization is completed, the current is cut off and stays off. It requires absolutely no attention, and is economical in its operation. In eighty-five days, the sterilizer used 290.6 Kw.-hr., and sterilized 6,588 pounds of dairy utensils. The average daily use of energy for two sterilizing operations was 3.4 Kw.-hr. or 1.7 Kw.-hr. per sterilization.

The most important requirements, according to all authorities, are correct temperature and dry utensils after the processing. The electric dairy utensil sterilizers meet these requirements and have the outstanding advantages of thoroughness, complete drying, automatic operation, no fire hazards and absolute protection of utensils until needed.

The old method of pouring hot water over the utensils has been found to be most unsatisfactory, because the hot water cools off in warming up the cold utensils, and in most instances it is poured around the outside of the inverted utensils, while the inside surfaces which actually come in contact with the milk remain cold.

Sterilizing all utensils in an electrically heated and thermostatically controlled sterilizer which assures temperatures of over 200 degrees for any desired length of time, takes the guess work out of sterilization.

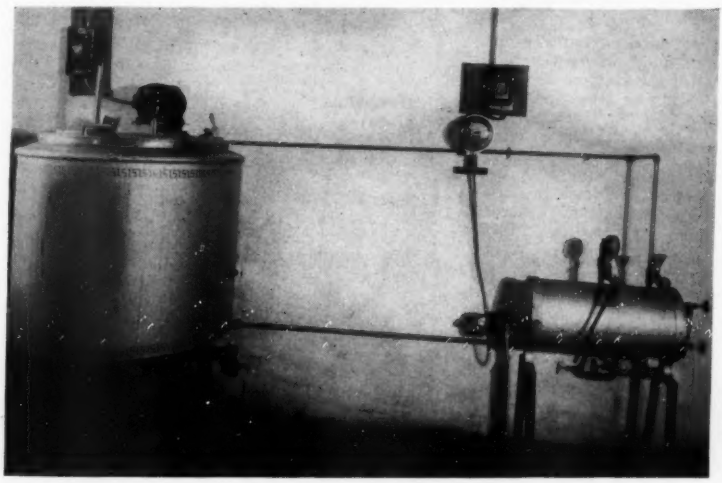
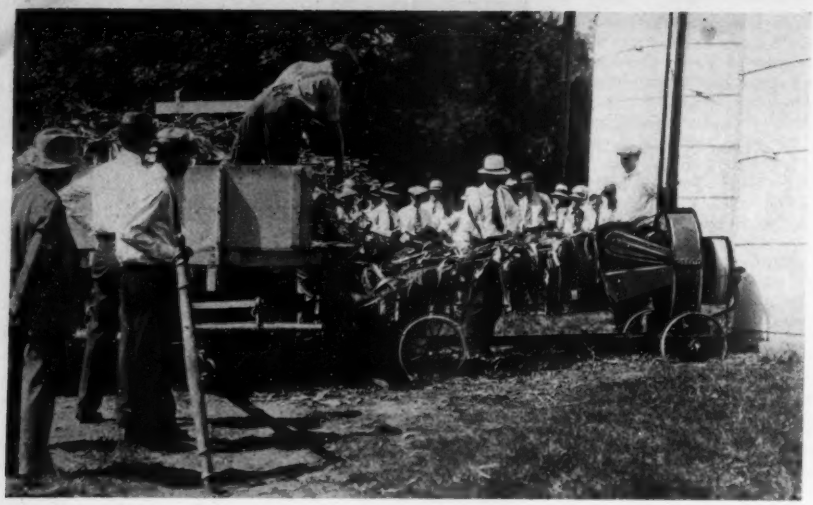


Fig. 5. At the Coker Dairy, Hartsville, S. C., a 4 Kw. electric steam boiler supplies steam to the pasteurizer.



A demonstration of operating an ensilage cutter with a 5 H.P. electric motor on the Ohio Agricultural Experiment Station Farm, Wooster, Ohio.

TAKING **BIG CREWS** out

By I. P. BLAUSER

THE value of ensilage as a feed is now generally recognized, and the silo filling operation is a part of the routine work on practically every dairy farm. On many farms that operation is looked forward to with a great deal of misgiving, because of the heavy work connected with it, the length of time required to make the round of the silo filling ring, and the uncertainty of getting the silo filled at the best time. On other farms, however, the silo filling operation is taken in the regular stride, because they have found a new, easier, cheaper and better way. This new and better way is by the use of electric power for operating ensilage cutters.

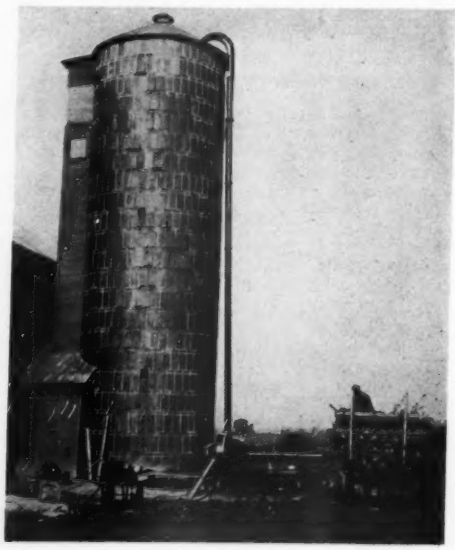
In Ohio, about *22%* of the farms have high line electric service, and probably more than 10,000 additional farms will get high line electric service before the end of this year.

When a farm gets electric service, another source of power is available for many different applications. A careful analysis of the farm power situation should be made, in order that different sources of power be used to the best advantage. Most farm electric lines are single phase lines, which means that the sizes of individual motors are usually limited to 5 or 7½ H.P. and that these sizes of motors must operate the ensilage cutter satisfactorily if the job is to be done with electric power.

Anyone that is accustomed to a silo filling crew of 15 to 20 men, and an ensilage cutter operated by a gasoline tractor or a steam engine, will doubt very much if a 5 or 7½ H.P. motor can do the job satisfactorily. A number of years ago that probably would have been true, but due largely to the fine work done by Professor F. W. Duffee, of the Agricultural Engineering Department of the University of Wisconsin, on ensilage cutter design, cutters now can be operated very satisfactorily with a 5 or 7½ H.P. electric motor.

In 1928 when we first used a 5-H.P. motor to operate an ensilage cutter on several farms of our Marysville Experimental Electric Line, I had no little difficulty in getting the farmers to let me fill, or attempt to fill, their silos with an ensilage cutter operated by a 5-H.P. motor. These farmers

This 40-ft. silo on the George Rausch farm was filled at the rate of 4.88 tons per hour, at a power cost of 2.9 cents per ton.

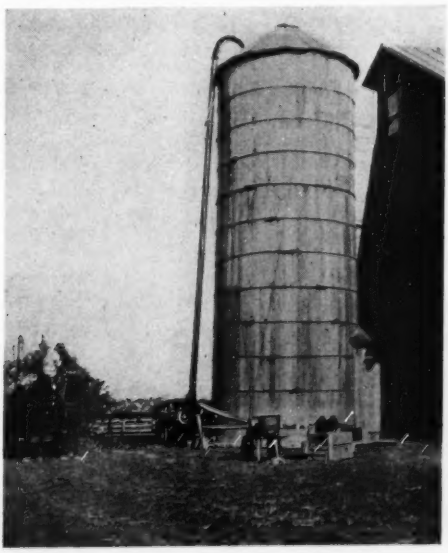


This cutter and motor is used to fill the silos on the Miller farm near Sunbury, Ohio, and also for cutting dry fodder and blowing it into the barn in the winter

# of ENSILAGE CUTTING

were in a silo filling ring, where the custom ensilage cutter was operated by a steam engine. They had seen this steam engine work pretty hard in operating the cutter, and now I wanted to use a 5-H.P. electric motor that was so small it could almost be put through the firebox door of the steam engine. The idea just did not make good sense. They were hesitant also to break away from the ring because in case of our failure with the motor they would be out of the ring and have no way of getting their silos filled. However, they consented when I promised to supply a tractor to operate the silage cutter if we failed with the electric motor.

This 12 x 36 foot silo on the Henry Coleman farm was filled in 15 hours with a 16-inch cutter and a 5-H.P. motor. 76 KWH. of electricity was used.



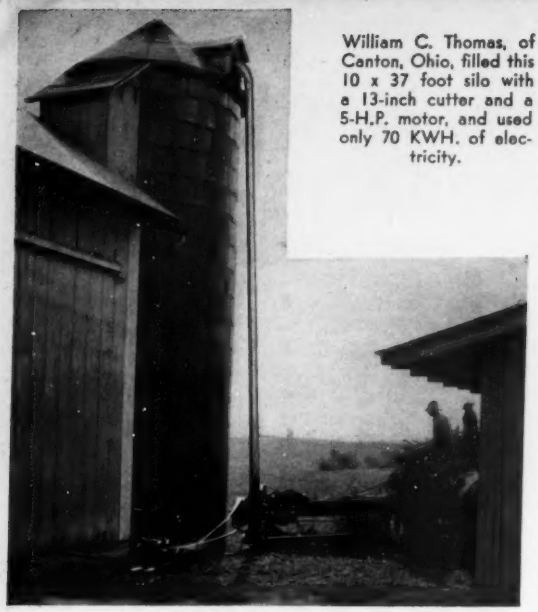
The first silo we filled was an 8'x28' silo on the Martin Volrath farm. An 11-inch cutter operated at a speed of 490 r.p.m. by a 5-H.P. motor. The length of cut was ¼-inch. The silo filling crew consisted of seven men, three men with teams, three men in the field for loading, and one man with a corn binder. The capacity of the silo was approximately 23 tons, and 23 K.W.H. of electricity were used during the 5½ hours that were required to fill the silo.

The next silo was on the Henry Coleman farm, and was 12' x 36', holding approximately 70 tons. The time required was fifteen hours, and 76 K.W.H. were used.

The next year silos were filled on the George Rausch farm, and the Lewis Nicol farm, as well as on the Volrath and Coleman farms. That year, however, a 16-inch cutter was used with the 5-H.P. motor. The highest silo was a 40-foot silo on the Rausch farm. The cutter speed for that silo was 430 r.p.m.

The average rate of filling, using a ¾-inch cut, was slightly less than 5 tons per hour, with an energy consumption of 1 K.W.H. per ton.

In 1928 the 10⅓' x 30' silo on the Lewis Nicol farm was filled by a steam outfit. There were 17 men in the crew and it took 5½ hours to fill the silo. The steam engine used 635 pounds of coal and one-half cord of wood. In 1929 the same silo was filled with a crew of 8 men in 9¾ hours, and a 16-inch cutter operated by a 5-H.P. motor which used 42 K.W.H. of electricity.



William C. Thomas, of Canton, Ohio, filled this 10 x 37 foot silo with a 13-inch cutter and a 5-H.P. motor, and used only 70 KWH. of electricity.

When we were setting up for the first silo, the operator of the custom outfit went by and jokingly said, "When you get through playing let me know and I'll finish the job for you." When we were filling the last silo he came by in his car but this time he came in to see what we were doing, perhaps because we had not called on him for help. He saw that little 5-H.P. motor operating the 16-inch cutter without the fuss or noise made by his big steam engine. After looking it over for some time he came to me and said, "Well, I see you are doing it but I still don't see how." The important factor between his cutter operation and ours was speed which will be discussed a little later.

H. P. Miller and son Russell, of Sunbury, Ohio, have still further reduced the size of their silo-filling crew. The crew consists of four men and the operation is continuous. As the accompanying illustrations show, they use a tractor to pull the corn binder equipped with a conveyor type bundle carrier, and the low down wagon which is loaded directly from the bundle carrier. That accounts for two men, another man or boy drives the loaded wagon to the silo and the empty wagon back to the field. The fourth man feeds the cutter from the low wagon.

I know of some farmers that are filling silos by themselves, but the operation is not continuous. To do this, a load is brought from the field, the cutter started, which is easily done with electric power, the wagon unloaded, the cutter stopped and a trip made to the field for another load.

The ensilage is not tramped, as experience has shown that tramping is not necessary. The distributor pipe is usually tied so that the ensilage falls in the center of the silo, occasionally the cone formed is leveled off.

As was mentioned above, speed is one of the most important factors in the operation of an ensilage cutter with a 5 or 7½ H.P. electric motor. Tests made by Professor F. W. Duffee show that increasing the speed of the cutter from 350 r.p.m. to 650 r.p.m. increases the power requirement 7 times, while the rate of cutting is not quite doubled. At the higher speed 3½ times more K.W.H. per ton were required than for the lower speed. The speed, however, must be high enough to give good elevation. Many of the older cutters will not elevate satisfactorily at slow speeds, and therefore cannot be used satisfactorily with a 5 or 7½ H.P. electric motor. To get good elevation at low speeds the clearance between the fan wings and the fan housing must be as small as possible. The clearance at the tips of the fan wings should not be over ⅛ of an inch and at the side preferably not over ¼ to ½ inch. Recommended minimum speeds vary from 310 r.p.m. for a cutter fan 48-inches in diameter (wing tip to wing tip) to 500 r.p.m. for a fan 30 inches in diameter for elevating into a 25 foot silo. For a 40 foot silo the speeds are 380 r.p.m. for the 48-inch fan and 610 for the 30-inch fan. For a 50-foot silo the speeds are 430 r.p.m. and 690 r.p.m. respectively for the 48-inch fan and the 30-inch fan. The recommended minimum speeds for a 40-inch fan are: for a 25-ft. silo, 370 r.p.m.; 30-ft. silo, 395 r.p.m.; 35-ft. silo, 430 r.p.m.; 40-ft. silo, 460 r.p.m.; 45-ft. silo, 485 r.p.m.; 50-ft. silo, 515 r.p.m.; and for a 75-ft. silo, 625 r.p.m.

Other important factors that need to be taken into consideration for satisfactory operation with a 5 or 7½ H.P. motor are sharpness of the knives and shear bar, proper adjustment of knives to shear bar, number of knives, the manner of feeding, the length of cut, and the electric service to the motor.

For power under 10-H.P. the use of a 2 or 3-blade cutter in the flywheel type is recommended in preference to a cutter with a greater number of knives. The knives must be kept sharp and properly adjusted to the shear bar. Ordinarily, changing knives twice daily is sufficient to keep them in good condition, but under adverse cutting conditions knives may have to be changed oftener.

When these factors are given their due consideration, filling the silo with electric power is an economical and satisfactory method, and a great deal of the dread of the silo-filling season is removed, not only for the men, but for the women as well, because there is no big crew to cook for.

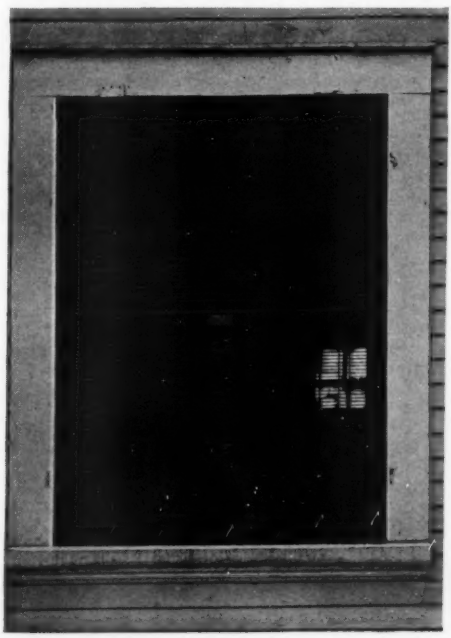
Rear view of field method of cutting and loading corn on the H. P. Miller & Son farm.

Electric fly trap in use in Indiana farm milk house. Flies are killed as they attempt to enter the trap.

An Effective Aid in the WAR ON FLIES

By T. E. HIENTON

ELECTRICITY has become another one of the many weapons to be adopted by man for use in his warfare against the insects which are constantly threatening his very existence. In recent years, flies and other insects have been attacked with electrocuting devices in efforts to control them. Electric fly screens and traps kill unwary flies that attempt to pass between their wires. Electric insect traps likewise exterminate those night flying insects that may be attracted to a lamp enclosed in one of them.



Electric fly screen on window of Purdue University dairy barn, Lafayette, Ind. Thousands of flies may be caught per day with a single screen.

Tests of the effectiveness of an electric fly screen have been conducted at the Purdue University agricultural experiment station. Agricultural engineers, entomologists and dairy husbandrymen united their efforts in 1929 to determine the possibility of using such equipment to control flies around dairy barns. A single screen, with area of 29.5 by 38 inches through which flies might pass, was installed on the university dairy barn in a location favorable to the congregation of flies.

The screen consisted of horizontal wires insulated from the wooden frame by means of porcelain. The wires were so installed that each adjacent pair would form a complete circuit when a fly or other object touched them. Electric energy for the screen was furnished from a 110-volt alternating current circuit and increased by a small step-up transformer to about 1450 volts.

Collections of flies killed were made during two periods, one from September 12-23, 1929 (11 days) and the other in 1930 from August 13 to September 6 (25 days). During the first period 172,167 flies were killed, an average of 15,651 flies per day, and during the second a total of 294,575, an average of 11,783 per day. The largest single day's catch was 18,566. During both years the number collected on the inside of the screen was consistently larger than that on the outside, although no baits were used with the screen at any time. The electric current consumed during a 55-day period in 1930 was 9.4 kilowatt-hours and during a 177-day period in 1931 was 39.3 kilowatt-hours. Average consumption of energy

for both periods was 0.21 kilowatt-hour per day.

Flies which passed through the screen were killed immediately or died within a short time according to observations made upon them. The species killed included some scavenger flies but the greater majority were of species annoying to cattle.

The screen shown in an accompanying picture is now in use on the dairy barn at the University. A 17-day check during May, 1936, showed that it used only .265 kilowatt-hour during that entire time due perhaps to the small number of flies available. Such screens appear to be effective in killing large numbers of flies and are being used in the larger dairy herds where high class dairy products are produced. Average initial cost per screen is less where several are used than where only one is used since one transformer may be used for several of them. In some installations, the upper parts of screen doors are electrified but they should be provided with a shield so that animals will not touch the sections which carry the electric current.

Electric traps for use around farm houses, milk houses or other locations where flies may collect are now available, one of which is shown in use in an Indiana dairy in an accompanying picture. The only installation necessary is connection to a 110-volt a.c. current since the transformer is built into one end. In the particular trap shown the bottom is made in the form of a drawer which can be removed to discard the dead flies. Baiting this trap may increase its effectiveness but the experience of the author has been that a few dead flies on the inside of the trap are a very effective bait. Such traps may be used around the farm house but should be located where there is no danger of children reaching them.

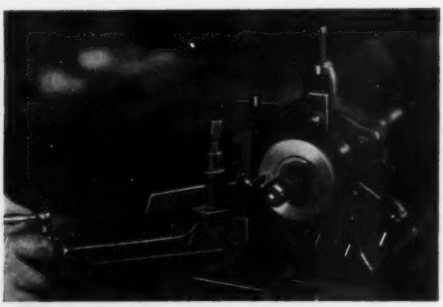
Repairing a Saw Mandrel

By L. M. Roehl
and
H. Clough

SOME circular saws after being used for a considerable length of time do not run true. They wobble and make cuts much wider than necessary for the saw to clear properly in the wood. This indicates that the washer is not held true or at right angle to the shaft. Some saw mandrels do not have much of a shoulder on the shaft for the washer to fit against. Either the shoulder on the shaft or the side of the washer may be worn and thus cause the saw to wobble. To correct this the mandrel needs to be removed from the frame and repaired on a metal lathe.

The inner washer is fastened to the shaft with a press fit. Use and changing of the saw and the fact that saws sometimes become warped may have caused it to wear the shoulder on the shaft out of true. In that event the washer needs to be removed and a new shoulder made. If the face of the washer is not true or at right angle to the shaft, it needs to be trued up.

In some instances it will be found that the shaft does not have any center in the ends so that you can center it in the lathe. When in this condition either one of two methods of procedure may be used. The shaft may be put in the lathe chuck and centered as close as possible so that it will run true then put the center rest on the lathe bed near the saw washer as shown in the picture. The center rest is needed to hold the shaft firm so that it will not chatter when facing the washer. If you do not have a center or steady rest for the lathe, it is necessary to make holes in the end of the shaft so that you can place it between centers. The way to do that is to chuck the shaft as true as possible then use a regular center drill in the tail stock chuck. The center drill must be fed very slowly as it breaks easily. It is good practice to withdraw the drill and clean it frequently until the desired depth is made. After the center hole is made in one end, the shaft is reversed and a hole made in the other end in the same way. After both ends are centered, remove chuck from head and tail stocks, putting face plate on head stock and centers on both head and tail stock. Then put shaft in lathe and lathe dog on the shaft and you are ready to true up the shoulder on the shaft or the face of the washer.

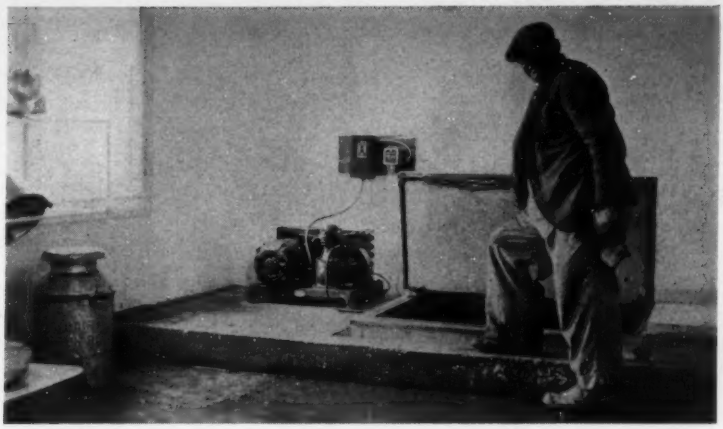


Truing up the washer on a saw mandrel.

A diamond point or a round nose diamond point cutter is placed in the tool holder and small cuts taken across the face of the washer until it is true.

In the event the wobbling condition reappears after the shoulder on the shaft and the face of the washers have been trued up, the washer is removed from the shaft and placed in the lathe and one side of it is counterbored about one-quarter inch bigger diameter and to the same depth. It is then placed on the shaft and brazed fast to the shaft. After it has cooled the assembly is placed in the lathe and both sides of the washer are trued up as shown in the picture.

This modern milk cooler installation on the W. J. Bone farm. Gravity, Pa., makes it possible for Mr. Bone to secure an extra premium for his milk.



GOOD HEAT INSULATION SAVES MONEY

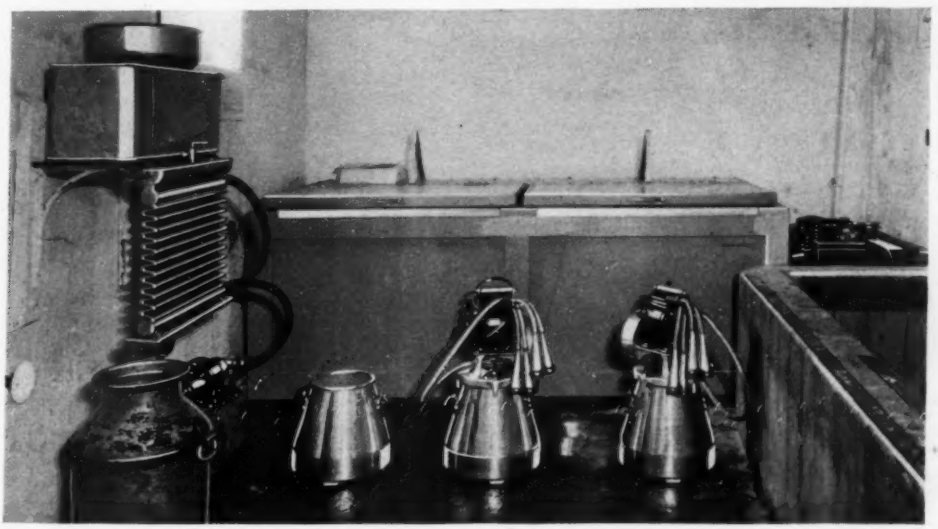
By B. A. JENNINGS

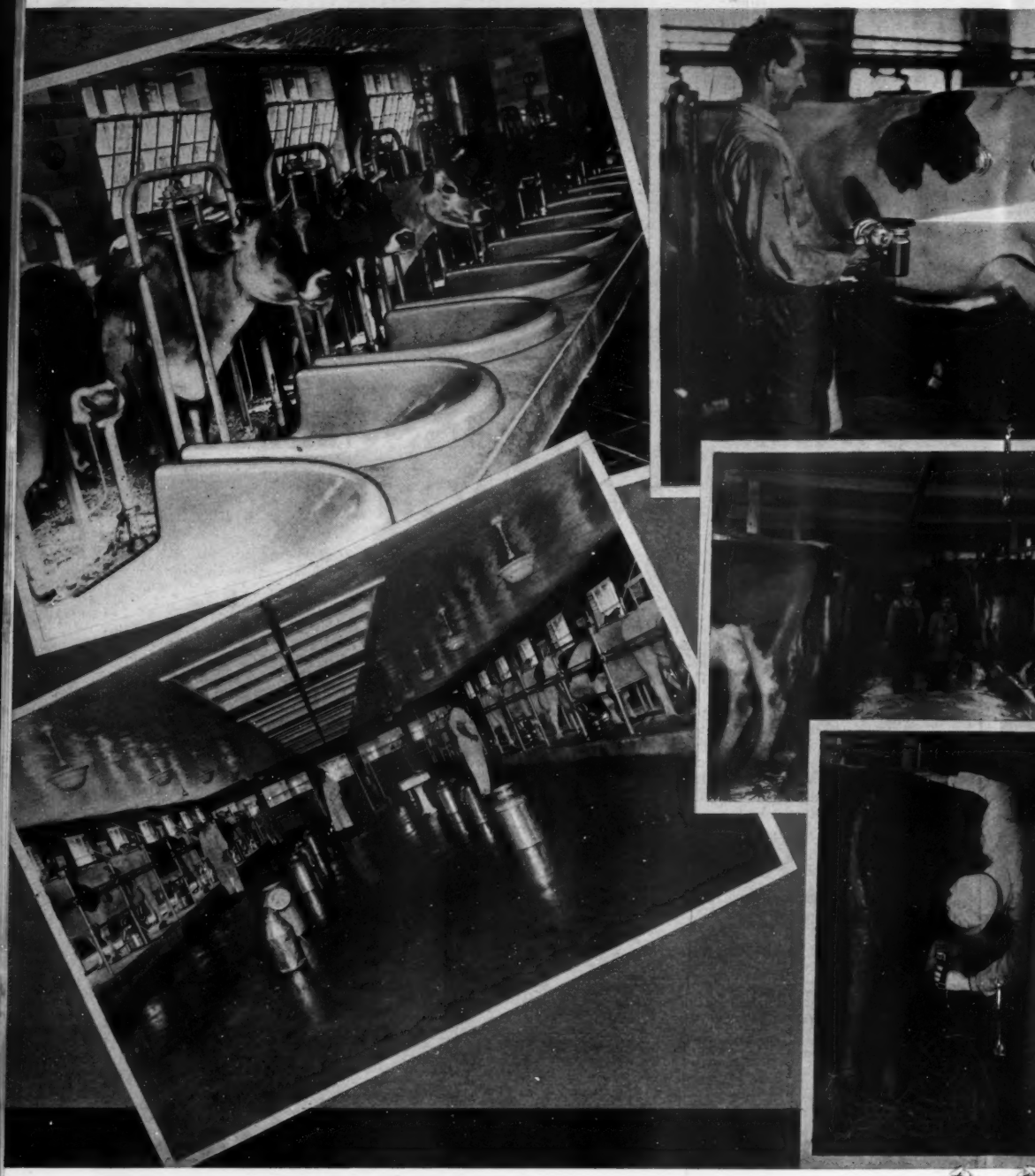
MILK cooling tanks are insulated to prevent heat from leaking into the tank. The heat which leaks into the tank warms the water, melts the ice formed on the coils to add to the load on the refrigerating unit. This makes the machine run for a longer period. The milk cooler must pump out not only the heat from the milk but also the heat that leaks into the tank. During hot weather, coolers often run from sixteen to twenty hours a day. Insulation of the tank cuts down on the number of hours of run.

It is commonly known that insulation is important during hot weather, but we were not certain just how much insulation affects the refrigerator during the cool weather of early spring or late fall. In order to determine this, a series of tests have been made at the New York State College of Agriculture. For these tests, two concrete tanks were used under the same conditions. The tanks were standard four can size, one insulated with

(*Continued on page* 18)

Milking units and cooling tanks make an excellent combination of labor saving equipment which tends to produce a clean, safe product.





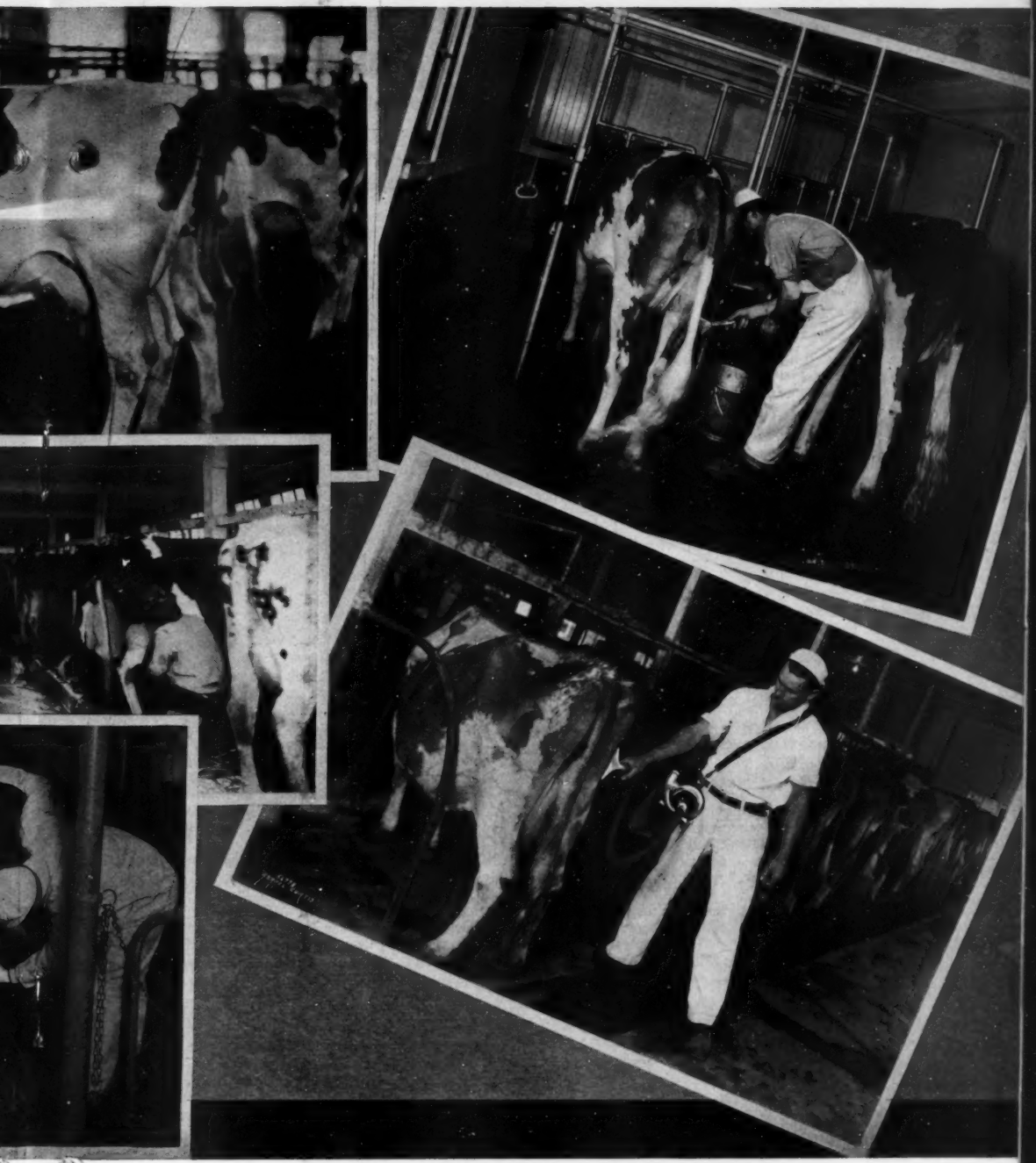
Upper left: The Vincent Astor estate, Ferncliffe, at Rhinebeck, N. Y., boasts of one of the most modern and sanitary cow barns in the U. S. Tile ceiling and walls, porcelain feeding and drinking troughs, and marble terrace curb, all make for cleanliness.

Upper center: Spraying of cows to prevent and destroy insects is one of the modern ideas to keep the dairy herd in a healthy and contented state.

Upper right: At Forge Hill Farm, Windsor, N. Y., owned by J. L. Wilkie, washing the cows before milking is an important part of the milking program, and is performed in specially constructed washing stalls adjacent to the milking room. An abundant supply of water is made available through the use of the electric pump.

Lower left: The Detroit Creamery Company produce milk in large quantities and under very sanitary conditions. The cows

Modern Methods of Milk Production Lay Stress on Cow Cle



are brought into the barn along an alleyway at either side of the milking room and guided into a stall. The operating space is about twelve inches below the stall level which eliminates much stooping in placing the milking machines.

Center: A dairy barn of the old type, which is vanishing with the approach of electricity in rural districts. Here milking is done by hand and other appliances which electricity makes possible have never been known.

Lower right: The utility cleaner, which is nothing but a specially arranged vacuum cleaner, is used on the Marymoor Farm, Kirkland, Washington, as an animal groomer, and is part of the procedure in preparing the cow for milking.

Lower center: Keeping the udders clear of excess hair growth by clipping is an aid in the production of clean milk, says the modern dairyman.

Cleanliness and Good "Housekeeping" in the Dairy Barn.

Standard 4-can tanks, one insulated, the other uninsulated, were employed for the N. Y. State College of Agriculture Tests.

three inches of cork, and the other uninsulated. Both tanks had covers with two inches of cork. Ice was kept in these tanks throughout the week, and the amount of ice that melted was a measure of the value of the insulation.

During an early run, the last week of April, the average maximum temperature was 58 degrees, and the average minimum was 34 degrees. During the week it was down to freezing four different nights. These temperatures indicate that the weather was extremely cool and we would expect very little heat to leak into the tank and very little difference between the amounts of ice melted. Such was not the case.

In the cork insulated tank there was an average melt of 27 pounds of ice per day against 50 pounds in the uninsulated tank. This big difference shows that insulation is important even during April weather.

Commercial tanks can be purchased with insulation from 1½ inches to 4 inches thick. Since the thickness affects the amount of heat leakage this should be taken into consideration in the purchase of a cooling tank. The initial cost of the tank is not the entire answer. Operating costs are equally important. In the purchasing or the building of milk cooling tanks, we should remember that insulation prevents heat from leaking into the tank, that heat will leak in whenever the temperature of the outside is warmer than the temperature of the inside, that the thickness of the insulation affects the amount of heat leakage and last, heat which leaks into the tank costs money because the cooler must run additional hours to pump this heat out.

Emergency Water Supply Located Under Cement Basement Floor

Felix T. Sheltra of Biddeford, Maine, wanted to enjoy the water from a hidden spring that he

knew as a boy. It was somewhere under his house. Daniel Marston, the town water-finder, located it. "Right there," said he, and down they dug and drilled through a cement floor, loom, hard-pan sand 35½-inch strata of rock, a total of 20 feet. Down went the line and, sure enough, a hand pump started the flow of water.

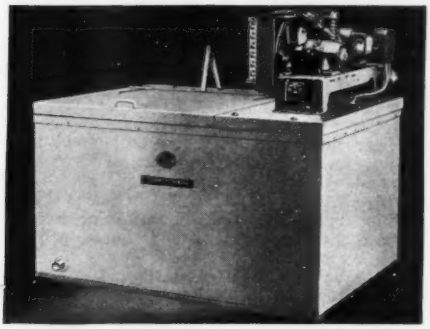
By the next morning water was flowing freely. A Uniflow shallow well water system was installed and soon the same water that Mr. Sheltra enjoyed as a boy was on tap in his home.

Then the big flood came, which did so much damage in New England last spring, and the local water supply was unfit for drinking. Mr. Sheltra set up a water station in his front yard and a battery of faucets were kept busy dispensing free water to the towns people of Saco and Biddeford at the rate of 3,000 gals. a day, for 18 hours a day.

Frame houses in which test tanks were located.

Pneumatic Water Agitation

Provides the Simple, Positive Way to Cool Milk Fast



The new McCormick-Deering Milk Cooler, built and sold as a complete unit, including both box and compressor.

Exclusive in McCORMICK-DEERING MILK COOLERS

YOU will get a new idea of milk-cooler efficiency when you see the McCormick-Deering with its pneumatic water agitator, a feature found in no other cooler. This makes it possible to cool milk to 50 degrees or lower in an hour or less, and to maintain that temperature automatically.

The pneumatic water agitator in the McCormick-Deering Milk Cooler is in reality a rotary air compressor, simple in design, with only one moving part. When quick cooling is required, the agitator is started by simply pouring a small quantity of clean water into the top filler hole. The water immediately seals the rotor, which pumps the air to the agitating air pipes located at the bottom of the box below the ice bank. The constantly rising bubbles cause the water to pass over the face of the ice bank where the water is thoroughly chilled and circulated all around the cans, from the bottom up to and over the milk level.

The agitator continues to agitate the water for approximately one and one-quarter hours, after which the water action stops automatically and the agitation continues to run free without consuming any power.

The McCormick-Deering dealer will be glad to show you how the pneumatic agitator operates and also point out the many other features of the McCormick-Deering Milk Cooler which have proved so popular with owners.

INTERNATIONAL HARVESTER COMPANY
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McCORMICK-DEERING

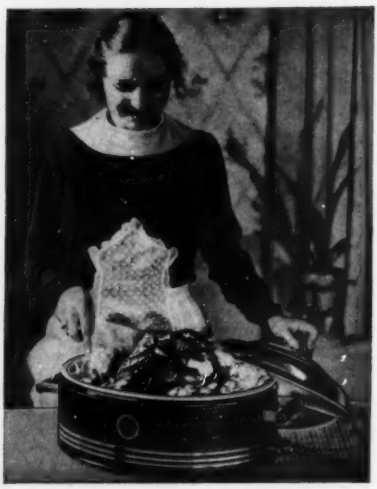
KEEPING COOL
While You Roast

By VERA M. MEACHAM

MY Aunt Kitty always used to tease her husband by saying that in the rest of her nine lives, she wasn't going to marry herself into the job of cook again. Cooking for a family of ten was so "plumb constant."

It still is, but modern fuels and modern methods have made it far easier for the cook. I don't know, of course, but I imagine Aunt Kitty would have thought it almost immoral to get a fire for dinner with no more labor than turning a black button on the front of a stove, and as for cooking a roast, not in the oven, but in a thick-walled roaster at the end of a long rubber cord,—she wouldn't have believed it if she had seen it with her own eyes.

Dinner is ready.



But we can do it.

If you yourself are looking for a good way to keep cool while you roast this summer, you can find it in the use of the new electric roasters the shops are showing to-day. They are big oval dishes, lined either with aluminum or porcelain, with heavy insulation around the walls and a metal shell outside. One model is black with smart bands of chromium. Another comes in ivory enamel with black handles of bakelite. On the front is a black medallion with a silver silhouette of an old fashioned girl, hoop skirt, poke bonnet, pantalets and all.

Both have removable pans that just fit the roaster. In one the pan is aluminum, in the other, brown enamel. There are also three separate dishes that fit together inside this pan. The larger dish is for meat, and the smaller ones that fit into the ends will hold two vegetables or a vegetable and a pudding. You can use them to cook a whole dinner at once with the same electric current and no watching at all.

With no watching, I say, for on the face of these roasters, right in one of the aluminum bands and below the old fashioned girl, there is a very modern looking dial with numbers around the edge, and a knob like the knob on a radio. This is the dial of the thermostat that controls the temperature. Both these roasters are automatic.

You have only to push in the cord and move the knob on the dial to the right place, then the thermostat will turn the current on and off to give you just the heat indicated.

As soon as you plug it in, a light shows in the face of the knob. This is a signal that the current is on and heating the roaster. When the temperature gets up to the point you have set on the dial, the light goes out because the thermostat has turned the current off again. Then you know it is ready, and you can put in your roast, your bread, or your biscuits.

After that, you will see, if you glance at the roaster now and then, that the light goes on and off, on and off. You use just enough electricity to keep the temperature you want. There isn't any being wasted, and you do not have to guess whether it has been on long enough. When you are preheating the roaster, the signal light tells you exactly when it is ready. You have measured heat, accurately maintained, just as you do in the oven of an electric range.

There can be added another control of interest to folks who want to have a long morning in the garden, or who have a big flock of chickens to look after. You can get your food ready, put the meat and vegetables in the separate dishes, plug in the cord and set a time switch to start it cooking in time for dinner. You can be down at

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HIRED help with a hundred hands is yours to command when electricity is utilized to best advantage. And best of all it's the cheapest . . . most dependable help you can get—never tired . . . never lazy . . . always doing its work quickly and cheerfully.

Of course, most farms cannot be completely electrified at once. So, to assist in planning the most useful and profitable electrification, Westinghouse has prepared a booklet, "Wired Help for Farm and Home," a copy of which will be sent on request. In addition, your power company and the Westinghouse dealer nearby will cheerfully guide you in a planned buying program fitted to your needs and pocketbook.

Look for the name Westinghouse on the electrical equipment you purchase. For 50 years Westinghouse has been an acknowledged leader in the electrical industry and today can supply almost every electrical need. Motors, switches, lights and wiring devices—appliances of every sort from ranges and refrigerators to toasters and warming pads. All are reasonably priced and of the highest quality.

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Rural Electrification Dept.
East Pittsburgh, Pa.

Please send me without charge a copy of your booklet "Wired Help."

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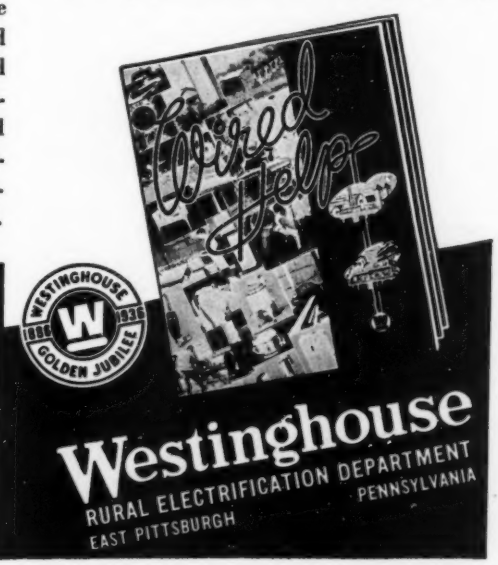


the end of the garden or half a mile away, or over in the next town; your dinner will start cooking on time just the same.

There is something new about the smooth finish inside the enamel roaster, too. It is easy to take care of, you know, because it is non-porous and food doesn't stick. Then in addition to that

Baking day.

it is stain proof and guaranteed against heat breakage. You can preheat the roaster to a searing temperature, just the dry roaster, without cracking the enamel, and then you could even take a roast right out of the refrigerator and lay it on the hot enamel. It would not damage the finish.

The roaster uses just 1000 watts. The wattage can be low because this is built-in heat, heat produced in the cooking dish itself, not coming to it from the outside. The wires are distributed so that just 10% of the heat is on the bottom to brown the roast and give a bowl full of gravy, but not enough to burn all those flavorsome juices that ooze out of the meat. All of the walls are hot, so there is no overheating of the lower part of the roaster, but an even heat is maintained to the top. As the manufacturer puts it, the heat line is high.

I have had one of these roasters in my own kitchen for almost a year now, and I know it is just as handy as it looks.

Most of our meat is cooked in it. With modern meat cookery demanding the same careful attention to time and temperature we have learned to give our baking, the accuracy of the heat control is a great boon. I baked two ducks for our Thanksgiving dinner in the roaster, I have used it for chickens; I have used it for pork; I have used it for lamb. It is just as good for the long, slow, moist cooking of cheaper cuts as it is for roasting, and it will make a generous kettle of soup without any watching. But meats are only a start. It is really a small well insulated oven for anything else, too.

I bake my bread in it. It bakes beautifully brown, tender crusted loaves of bread. It bakes them exactly as well as the oven of my electric range does, only it will not bake so many at once. I have baked pies, cakes and even cookies in the roaster,—the cookies just to see if I could. And when I tell you that one of the cakes was an angel food, I am sure you will agree that the distribution and control of the heat is even and accurate.

You could use it for canning, too. The home economist from the laboratory at the factory where one of these roasters is made says you can process 9 pint jars or 3 quart jars and 4 pints in the roaster at once. You would use it according to the directions for oven canning of any fruits or acid vegetables. Since you have an accurately controlled heat, you can expect uniformly good results.

These new roasters are a most effective argument for the decentralization of cooking, if we may borrow a phrase from the program of the administration. They work so well, and,—like all cooking at the end of a cord,—they are so cool and convenient.

Rural Electrification Department for Westinghouse

Joining in the great interest displayed by the government farmers and utilities in rural electrfication, N. G. Symonds, Vice President, Westinghouse Electric and Manufacturing Company has announced the formation of a Rural Electrification Department under the direction of G. A. Sawin.

At the present the department will be represented by two field men, B. P. Hess and R. L. Pleak, both agricultural engineers with wide experience in rural problems.

Mr. Hess will have his headquarters at East Pittsburgh and will cover the eastern and southeastern part of the Country. Mr. Pleak will be located in Chicago and will be responsible for the northwestern and southwestern sections. Their entire time will be devoted to promote the use of electricity on farms.

Mr. Hess was graduated from Ohio State Uni-

(*Continued on page* 28)

G. A. Sawin, Manager, Rural Electrification Department for Westinghouse Electric and Manufacturing Company, is discussing with his men the plans for the newly formed department. Shown left to right are B. P. Hess, R. L. Pleak, G. A. Sawin, and S. M. Marshall. Mr. Hess and Mr. Pleak are field men for the eastern and western sections respectively.

ELECTRICAL HOUSEKEEPING

Conducted by GAIL MEREDITH

The RULE OF THREE

TAKING care of the new refrigerator in your kitchen is a very simple job. To do it right, you have only to get the hang of three things—just two of them new. You have to learn how to put your food away, how to keep the box clean, and when and how to defrost it.

All of these things were probably called to your attention in the recipe book that came with your refrigerator.

Those careful directions for storing your food are offered not because the manufacturer of that electric refrigerator would care a bawbee if you did thrust everything into it higgledy-piggledy, a plate of butter teetering across the top of a cream pitcher; Sunday's roast jostling a few lanky shreds of cabbage—if that was all there was to it. But it isn't. Your way with that refrigerator will make a difference in the length of time your

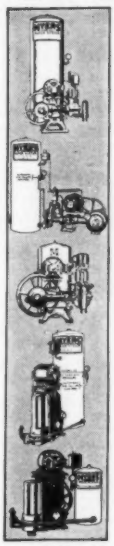
Above: Eggs and fruit keep cool in the shelves on the door.

Below: Convenient and attractive dishes for storing food.

RUNNING WATER

YOUR FAMILY DESERVES IT

FARM machinery can be repaired and made ready for service "between seasons." But a water system must be ready every hour, day and night, the year around. Interruptions of service for repairs are always inconvenient. That is why the famous dependability of MYERS' Water Systems is doubly valuable. Thousands of satisfied farm and suburban users can tell you how wonderfully durable and free from repairs MYERS Water Systems truly are. You are assured of lasting satisfaction when you install a MYERS. Built in styles and capacities to suit all needs—for deep or shallow wells. Take advantage of present low prices and write today for free booklet of information. Our local dealer will be glad to assist you in selecting the equipment that best meets your requirements.



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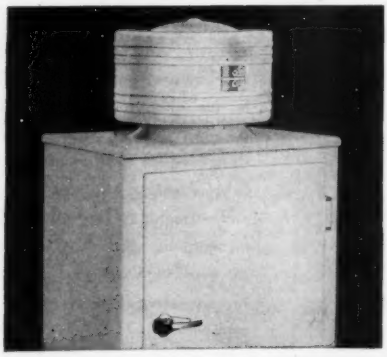
MYERS WATER SYSTEMS

Vegetables keep crisp in these covered enamel dishes.

food keeps sweet, or crisp, or wholesome, and it will make a difference in the atmosphere of the box. Odors, to be explicit. So your satisfaction is at stake. And any manufacturer is anxious to help you get the satisfaction you thought to buy with your refrigerator.

To begin with, do not put food into the box while it is hot. Put foods away according to their needs. In the coolest place, below or at the side of the chilling unit, put milk, cream, butter, soup stock, and uncooked meat. In the



Turn the switch here and you automatically defrost the chiller.

next coolest place, put eggs, cooked meat, left overs, cheese, shortening, salad oils, and fruits or vegetables with a mild odor, then the fruits and vegetables with strong odors.

Most foods should be covered. Meat shouldn't, not before it is cooked. It keeps best if it is unwrapped, scraped, and trimmed then put away on a plate. If you like, you can lay a waxed paper over the top to save it from any chance splashing.

Fruits are not covered either. Berries may be turned into a large dish or tray, not too solidly packed and spread out so the cold air can circulate over them. Peaches and plums need the same care.

But vegetables should be put into a large covered container or into glass jars. It will save you space and minutes at mealtimes if you clean the vegetables thoroughly before you put them away. They will keep fresh and crisp for some time in a covered dish.

If your jars or dishes haven't tight tops, you can improvise covers with waxed paper and rubber bands. Waxed or parchment paper makes an excellent wrapping for foods in the refrigerator by itself. There are even cellophane envelopes of different sizes that will slide over a plate of food, or take in a pound of butter, and let you look through at the food.

Every department store, and every hardware store, and all the five and tens have displays of dishes particularly designed for storing food compactly in an electric refrigerator. Often the dishes fit one on top of the other. Sometimes they are enamel, sometimes they are glass, clear, rose, or an opaque green, or the oven glass that can be used for cooking, serving and storing food.

Having the covers on tight serves the double purpose of keeping the food from drying out, and keeping the odor of any food strictly where it belongs.

When putting the dishes on the shelves, leave ample space so the cold air can pass between them to keep them cold.

Cleaning the refrigerator is a very easy job. After you have emptied it, you can wash it off, shelves and sides with lukewarm water and a little borax or soda, and dry it with a dish towel. You can treat the chilling unit the same way, and wash the ice cube trays whenever they are emptied.

A clean refrigerator with food stored in covered dishes has no odors.

The outside can be washed or dusted as finger prints demand. A thin coating of wax protects the finish and will help it keep its lustre longer.

Then you must keep an eye on the chilling unit and defrost it regularly. I do not mean regularly by the calendar, but regularly by the

(*Continued on page 26*)

The raw meat is left uncovered, remember. An adjustable shelf makes room for the fat watermelon.

ON THE AIR

Conducted by JEROME J. HENRY

Rather Be Ripley Than President

NEW YORK boys, between 8 and 18 would rather step into the shoes of Robert L. Ripley, J. Edgar Hoover, or James Cagney than take over President Roosevelt's job. This was brought out in a poll taken at the Boy's club of New York whose 11,000 members include many races and creeds.

The questionnaire, circulated among the boys to discover the current mode in hero worship, contained the query: "If you had your choice of all the jobs in the world, whose job would you want?"

The winners were Robert Ripley, J. Edgar Hoover, James Cagney, Dizzy Dean, Jack Dempsey, President Roosevelt, Lewis J. Valentine, King Edward VIII, Mayor Fiorello La Guardia, and Walter Winchell.

• • •

Radio Useful to Farmers Through Summer

NOT so long ago the radio broadcasters felt the summer doldrums were a necessary evil. Today radio goes on through the seasons with scarcely a let down in the quality and quantity of entertainment offered. Some changes are made, of course, in keeping with the feelings of we fickle fans.

And so this summer promises an especially pleasing variety of musical, dramatic, and entertaining

Dwight Weist, actor-impersonator on the March of Time, sometimes sees things after strenuous nights in the studio. Here he is with masks of Johnson, Roosevelt, Hoover, and La-Guardia showing how it feels when his subjects turn the tables on him after hours.

programs. Those of us who live on the farm find the "farm" programs particularly useful in the summer time. They present a wealth of practical information that is applicable as soon as received. This summer a farmer can keep informed on the

HOW TO DO HARD JOBS THE EASY WAY

Since the earliest days of rural electrification, Century Single Phase Motors have done a pioneering job providing farm families with the many benefits and profits of electric motor power. . . . Backed by such a long record of reliable service, Century is naturally the preferred motor for doing more of all kinds of hard farm work—better, cheaper, faster and with greater ease than you can do it by hand. . . . Use Century Motors—pioneers in the fields of rural electrification—"They Keep-a-Running".

CENTURY ELECTRIC COMPANY
1806 Pine Street St. Louis, Mo.
Offices and Stock Points in Principal Cities

Century
MOTORS
UP TO 600 H. P.

SAVE COST OF SPRAYS!

KILL FLIES & BUGS ELECTRICALLY!

KILL THOSE FLIES Electrically BEFORE they get inside! It's easy to kill Flies, Insects, Beetles, etc., with the

DUROBAR
ELECTRIC SCREEN

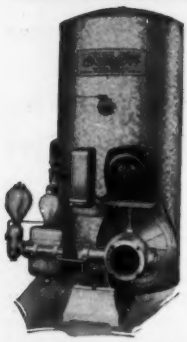
Safe—inexpensive—foolproof—uses very little electricity. Lasts a lifetime—first cost is the last cost. Works in rainy or foggy weather. Saves the cost of sprays. Thousands of satisfied users.

It costs you nothing to find out about this sanitary, sure, modern method of destroying flies and insects outside the building. *Write today for complete information and prices.*

National Electric Screen Co.
Dept. E-F 4, 29 N. Peoria St., Chicago, Ill.

FRUITGROWERS and GARDENERS *Write for free information on how to get a perfect crop without the use of sprays.*

DOES SHE NEED THE EXERCISE?



ELECTRICITY COSTS ABOUT 45¢ A MONTH TO OPERATE UNIFLOWS

A complete Uniflow Water System as low as $46.00 and F.H.A. will help to finance it. A few chickens will help to operate it. Now, why can't your family enjoy its own private Uniflow Water System? Write for free catalog.

ELECTRIC
Water Systems
Cellar Drainers
Milk Coolers
Refrigerators
&
Water Softeners
SEPTIC TANKS

1503 EAST LAKE ROAD
UNIFLOW
ERIE PENNSYLVANIA

soil conservation program by radio, can hear the latest information from his experiment station and agricultural college.

Equally interesting and important are the news broadcasts, with pleasing voices sending us the news, red hot news that reaches farm and city with equal speed, without discrimination because of consuming time traveling longer distances.

Speaking of news commentators, have you heard Boake Carter recently? A veteran broadcaster, Carter seems ever to improve in his style and interest. Then there's the March of Time broadcast which, fortunately, will be continued through the summer months of 1936. If you like the news reenacted for you instead of just told, you can get a good deal of excellent information as well as entertainment from that daily feature. Of course, it comes a little late for farm families, but is well worth staying up for at least occasionally.

• • •

Wendell Hall No Show to Sons

WENDELL HALL, radio's red-headed music maker, tells this one on himself.

The singer-composer was playing a stage engagement, and Mrs. Hall, thinking to surprise their two sons, took them to the theatre without telling them that their father was on the bill. It should be explained that the Hall children had been allowed to attend but few movies, and therefore considered them an unusual treat.

The stage show started and soon Wendell appeared.

"That looks like Daddy," said Lowell, aged 6.

"It is your daddy," replied Mrs. Hall.

"Huh," said the boy, "when does the real show start?"

The Rule of Three

(*Continued from page* 24)

amount of frost. It should come off when it gets a quarter of an inch thick.

If your box has an automatic defroster, turn the pointer that selects the temperature to the defrosting position, or turn the special defrosting switch. Take any food out of the tray beneath the chilling unit. If you do this at night, the defrosting will be done in the morning.

For quick defrosting, you can turn the current off entirely, empty the ice cube trays and fill them with either hot or warm water. If your refrigerator book does not give you directions for this, it would be wise to call your dealer and ask him if the box you have can be defrosted this way. If it can, you will find it a speedy method to use. The frost will melt off while you are doing the breakfast dishes.

That thick layer of frost is not cooling your refrigerator, so do not be tempted to let it pile up. It acts as an insulating blanket over the chiller, and your motor has to work harder to keep the box cold. More work, more money. So both economy and efficiency demand regular defrosting.

Vocational Training

"Do you believe that a college training helps a young man to get a position?"

"Yes. My son was a champion sprinter at college, and now he's a bank runner."

Questions and Answers

Conducted by R. U. BLASINGAME

Book on Electric Motors

Question: *I would like to know if you could recommend to me a book on connecting up electric motors to a power line, one or many, and oblige.*
O. K.

Answer: I believe that the following book is a first rate reference on the question which you have in mind: American Electrician's Handbook, by Croft; Published by McGraw-Hill Book Co., New York City.

Wiring for Electrical Equipment

Question: *I am interested in securing some information in connection with the electric wiring which I have installed. In the garage I have installed a 100 ampere switch and have used No. 10 wire for, and between the out buildings, No. 6 wire being used between the house and the garage. I have been advised by my Power Company representative that a 60 ampere switch at the meter would be sufficient and that No. 6 wire would be suitable for use from the meter to the garage.*

I want to install more wires from the house to the garage as I now have 110 volt A.C. and want to re-write for 220 volt A.C. At present trees prevent using overhead wires in this section. However, I want to clear this section between the house and the garage as my radio aerial is also installed there.

In an article in the March issue of your magazine I read that a ½ H.P. motor was used on a 4½" burr mill. Isn't this an error? According to catalogs I have seen, the requirement is 1½ H.P. motor and up. I would like to know how many H.P. I can use on 60 amperes and on 100 amperes. I would also like to know the total watts or amperes used by the average electric range if all burners are turned on. Also, is weather-proof wire used in a conduit underground?

I am interested in the following equipment: a feed mill to grind oats and corn; a small hammer mill; burglar and fire alarms; electric drills; a time switch electric range; a 5 H.P. motor and smaller, and miscellaneous electrical material.

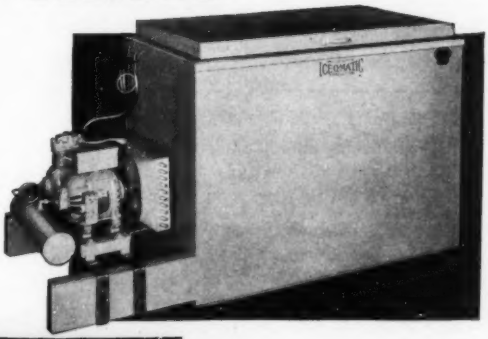
I have a washer, ironer, vacuum cleaner, ½ H.P. water pump outfit, toaster, several hot plates a radio, two ¼ H.P., two ½ H.P., and one 1½ H.P. motors.

I shall appreciate any information you can give me.
W. W. W.

Answer: The 100 ampere switch in the garage is of adequate size to take care of your proposed load. Two No. 4 and one No. 6 should be run between the house and garage. Two No. 6 and one No. 8 between house and granary assuming that some day you will use at least a 5 H.P. motor in granary. Use the No. 10 wire to branch off

GET RID OF MILK COOLING DRUDGERY
MAKE MORE MILK PROFITS WITH
ICE-O-MATIC

LET Ice-O-Matic get your milk down below fifty, so it always stays fresh and pure. Milk dealers say they get premiums up to $.60 per cwt. by using Ice-O-Matic! Ice-O-Matic uses Methyl Chloride, finest refrigerant known. Pressure lubrication. In all sizes to fit any need. Automatic electric drive. Write us for complete information.



WILLIAMS OIL-O-MATIC HEATING CORP.
World's Largest Specialists in Temperature Control
Dept. 722, Bloomington, Illinois

WILLIAMS WILLIAMS ICE-O-MATIC REFRIGERATION *ENGINEERED*

How to Get Manufacturers' Catalogs

● ***Readers—we are glad to help you secure catalogs and descriptive literature on electrical appliances and equipment. It is a FREE service and NO OBLIGATION is involved.***

● ***But before you ask our assistance be sure to study our advertising pages. And when you write advertisers tell them you saw their advertisement in ELECTRICITY ON THE FARM.***

● ***For any further information you need—use the handy coupon below—listing the appliances for which you want catalogs.***

50 FAVORED USES—

Animal Clippers
Better Sight Lamps
Bottle Washers
Brooders
Bunch Tyers
Burglar Alarms
Churns
Clocks
Clothes Washers
Corn Shellers
Cream Separators
Dairy Sterilizers
Dishwashers
Drills
Electric Lawn Mowers
Ensilage Cutters
Feed Grinders
Feed Mixers
Flat Irons
Floodlights
Food Preparing Machines
Hay Choppers
Hay Hoists
Ice Cream Freezers
Incubators
Insect Traps and Screens
Ironing Machines
Light for Plant Growth
Lighting Fixtures
Milk Coolers
Milking Machines
Motors
Paint Sprayers
Radios
Ranges
Range Replacement Units
Refrigerators
Sewing Machines
Soil Heating Equipment
Soldering Irons
Table Cooking Appliances
Tea Kettles
Threshing Machines
Tool Grinders
Ultraviolet Light
Vacuum Cleaners
Vegetable Washers
Ventilators
Water Heaters
Water Pumping Systems
Water Softeners
Woodworking Machinery

FREE INFORMATION COUPON

ELECTRICITY ON THE FARM
24 W. 40th St., New York

Without cost to me, please have manufacturers send complete information on the following Electrically Operated Equipment which I am thinking of buying.

....

....

My name is.....

Address .....

.....

I get electricity from.....

.....7-36

this line, between house and granary, to the various out houses, such as crib, chicken house, tool house, etc.

It would be preferable to use a 100 ampere 110 volt/220 volt, main switch at the meter and to use two No. 1 and one No. 2 between meter and garage.

A 7½ H.P. motor is as large a motor that can be started on 220 volt, 60 ampere fuse unless a starting device is provided; however, this fuse will carry a total of 14 H.P. A 100 horsepower 220 volt fuse will carry a total of 22 H.P. but will not start this size motor unless provisions are made.

The average size electric range has a total load of approximately 8500 watts. Do not use weather-proof wire in conduit under ground. It is advisable to use lead covered cable in the conduit under ground. Rubber covered wire is sometimes used but is not as satisfactory as lead.

A ½ H.P. motor can be used on a 4½ inch burr mill. The process of grinding is somewhat slower than with a larger motor. This setup is usually found where feeding the mill is taken care of automatically by overhead hopper and ground grain is elevated or allowed to fall in a feed bin.

Rural Electrification Department

(*Continued from page 22*)

versity with a degree in agricultural engineering in 1922. He then served two years as Brown County agricultural agent. For two and a half years he was engaged in field work in rural electrification on the Marysville, Ohio, project. Reentering Ohio State in 1927 he enrolled in the electrical engineering course and was graduated in that subject in 1930. He then became identified with the Westinghouse Company and has devoted most of his time since to rural electrification problems.

Mr. Pleak attended both Michigan and Stanford Universities being graduated from the latter in 1902. He operated a general stock farm in Indiana for 15 years and conducted experimental work for Purdue University. In 1917 he entered the employ of the Westinghouse Company as a salesman contacting power companies for rural developments.

The services of this Department are available to any one interested in the promotion of electric service on farms or in rural areas. Should this service prove popular and useful, the Company would anticipate enlarging the Department to meet the greater demands placed upon it.

Security

What is security for the goose should also be security for the gander.

A full-blooded Pima Indian out in Arizona needed some cash, so he went to a banker and asked about a loan.

"How much do you need?" asked the banker.

"Me want $200."

"For how long?"

"Maybe two week; maybe two month."

"And what security have you?"

"Me got 200 horses."

This seemed sufficient security and the loan was made.

A short time afterward, the Indian came into the bank with $2,200 cash, paid off the note, and started to leave with the rest of his roll.

"Why not let us take care of that money for you?" asked the banker.

The old Indian's mind flew back to the day when he wanted $200 and, looking the banker straight in the eyes, he solemnly asked, "How many horses you got?"

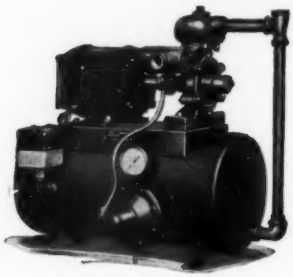
What's New

Reviewed by T. E. HIENTON

Names and addresses of manufacturers of the articles described in this column will gladly be furnished upon request. Address your requests to What's New Department, ELECTRICITY ON THE FARM, *24 West 40th Street, New York, N. Y.*

Turbine Water Pump

Supplying water for farm use is a daily job which requires constant attention. Automatic operation of electrically driven pumps reduces the human attention to practically nothing. Because of this fact and the labor-saving qualities, many farmers and their wives consider the electric pump the most important item of electric equipment on the farm.

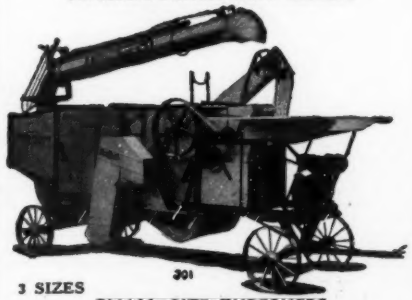


A line of water systems for shallow wells and cisterns has recently been announced by a middle-western company. Two sizes, 300 and 500 gallon per hour, are driven respectively by ¼ and ⅓ horsepower motors and are available in three different styles: the first is a fresh water unit without storage tank; the second with a 7½-gallon storage tank; and the third with a 42-gallon storage tank. A balanced impeller is the only moving part. Motors are of the repulsion-induction type.

Lathe

Farm work shops are being equipped with a wide variety of tools which may be required in repairing and servicing the farm machines in use. Many

MESSINGER MFG CO., TATAMY, PA.
Threshers-Dusters-Corn Shellers



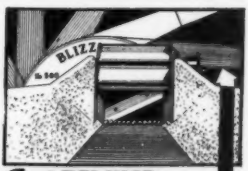
3 SIZES
SMALL SIZE THRESHERS
For Rural Electric Lines 3 to 5 HP Required

For really modern Electric Cooking
CHROMALOX
Super-Speed
ELECTRIC
RANGE
BURNERS

They will fit your electric range. Install them in place of worn out burners. Ask your power company, your electrical dealer, or write us.
Edwin L. Wiegand Co. 7580 Thomas Blvd. Pittsburgh, Pa.
ASK YOUR POWER COMPANY for a DEMONSTRATION

ALABAX
LIGHTING FIXTURES
for
HOME and FARM
Illustrated and described in our new Lighting Fixture Catalog:
AL2
Write for Your Free Copy Today!
ALABAX DIVISION
PASS & SEYMOUR, Inc. - Syracuse, N. Y.

GET NEW
3-COLOR CATALOG
—gives full details of Blizzard Success with
ELECTRIC POWER
also "12 Reasons Why Blizzard Excels." Write today.



Fill Silos or Chop Hay the Blizzard Way
2 JOBS — 1 MACHINE. Hay chopping first — silo filling later — both done most efficiently with the NEW BLIZZARD. Not a nut or bolt need be changed. Not a nut or bolt need be changed. Marvelous! Speedy! Write for Catalog today!
And DELIVER IT WHERE YOU PLEASE! *Any Angle . .*
BLIZZARD MFG. Co., Box 12, Canton, Ohio

GRIND ELECTRICALLY
Grind Feed with an Electrically Driven W-W

With your low-cost electric power and a W-W Hammer Grinder you can grind and mix everything — from the heaviest roughage to small grains. Hard-to-chew stalks and stems, fodder, bundle feeds, maize heads, ear corn with shuck, etc., can be quickly converted into nutritious feed with the W-W.
Write for Full Details
Tell us what you have to grind, and how much. We'll make recommendations, send you illustrated material and prices—no obligation of course.
W-W FEED GRINDER CORP. Wichita Kansas

farms have an automobile, truck and tractor in addition to field machinery, all of which demand regular repair. The loss of a day or even several

hours during a rush season is prevented by some farmers who have a well equipped farm shop which includes a lathe.

A middle-western manufacturer of a well-known line is announcing a 9-inch lathe which is offered in eight different models. Of particular interest to the farmer is the fact that any of the following metals can be machined: cast iron, steel, cast steel, steel forgings, wrought iron, brass, bronze, copper, babbit, aluminum and alloy steels and metals. Either right or left hand screw threads of 4 to 40 per inch may be cut by the twin gear reverse. Power is provided by an electric motor of suitable size.

Motor-Driven Egg Grader

Eggs must be sold by grade according to the laws of several states. The grading process includes individual weighing and candling of eggs which requires considerable time and labor where large numbers of eggs are graded by hand. Egg

grading machines driven by electric motors reduce this time and labor to a small fraction of that consumed by hand methods.

Five sizes of egg graders are offered by an eastern manufacturer of such equipment with rated capacities ranging from 4 or 5 to 10 cases per hour. The larger machines deliver two quality grades with five weight grades for each quality. The smaller machines deliver one quality grade with four or five weight grades. Four of the five models may be equipped with a trade-marking attachment. Power for three models is furnished by a ¼-horsepower motor and for the other two by a 1/6-horsepower motor for alternating or direct current, 110 or 220 volts.

Electric Insect Trap

Electricity is becoming more important in the control of insects as electric traps of various kinds are developed to destroy them. Many insects are attracted to artificial light and this situation serves to make electric traps increasingly important as research discloses proper intensities necessary and types of lamps of greatest attractiveness.

An electric trap recently developed on the West Coast is made in three types, two of which may be used both indoors and outdoors and the third for outdoor use only. The upper part of the first trap is made of metal with spring arms which hold glass trapping pockets. Insects are collected in the detachable bottom bowl and removed when necessary. This type is made in four sizes, for 60, 100, 200 and 500-watt lamps. The second type of trap is made particularly for use in a store, hall or on a porch and fits light fixtures or bowls already in use. It is made in two sizes only for 200 and 500-watt lamp. The third type is like the first but has a hole in the bottom bowl to which a standard Mason fruit jar is attached to provide more storage space for insects. It is made in three sizes for 100, 200 and 500-watt lamps.

CLASSIFIED ADVERTISING

IDEAL HAY HOIST operates Hay Carrier with 2 to 5 H.P. motor or engine. Saves extra team and driver all through busy haying season. 10 DAYS' FREE TRIAL. Write for circular 206, UNIVERSAL HOIST & MFG. CO., CEDAR FALLS, IOWA.

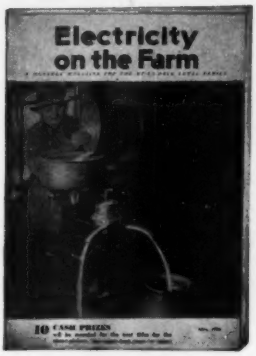
LYON FLY ELECTROCUTORS kill disease-carrying pests the easiest way. A Lyon electrocutor can kill thousands of flies daily at a cost of a cent or two. Cheaper than spraying. Built for long service. Fireproof and waterproof. Send for FREE catalog describing money-saving brooders, alarms, electric material for homemade equipment. Lyon service will save you time and money. LYON ELECTRIC CO., Dept. E. F., San Diego, Calif.

GUARANTEED MILKING MACHINE RUBBER for all makes at REDUCED PRICES. Special inflations for all type shells. New improved teat cups—inflations suitable for all pipe line milkers. Better, faster milking. Also famous Rite-Way Milker. Double, single units. Electric pumping outfits. 5-year pulsator guarantee—no upkeep cost. Attractive user agents proposition. Some territories left. Write for literature, low prices, special offers. State name machine used. Rite-Way Products Co., Dept. B101, 4005 N. Tripp Ave., Chicago.

SAFE, SANITARY ELECTRIC LAMP KILLS INSECTS AUTOMATICALLY without bait or cost where light is needed. Amazing results in garden, farm, lawn, business house, home, etc. Lifetime service. Price $2.75 up. Literature free. SAUER BROS., MFRS., 5226 E. 12th St., Oakland, Calif.

HOW TO TELL TIME BY THE STARS—New illustrated booklet fully explains how and why. Fascinating pastime. Easy to learn. Single copies 25c postpaid. 5 for $1.00, including Jr. Sky Map FREE. Next Year's Best, Mount Vernon, N. Y.

COVER TITLE CONTEST



MAY COVER

JULY RULES

Ten cash prizes will be awarded for the 10 best titles for the picture on the front cover of this magazine.

The first prize will be $20 cash, and nine second prizes of $2 in cash will be awarded.

In case of a tie, each winning contestant will receive the full cash prize to which he or she is entitled.

Title should be brief — the shorter the better — and short slogans will be given preferences over rhymes.

All members of the farm family to whom this magazine was sent may submit titles, but each contestant may submit only one title.

Question "A" must be answered.

Entries must be sent to the Title Editor, ELECTRICITY ON THE FARM, 6 North Michigan Avenue, Chicago, Illinois, before August 1st.

Winning names and titles will be announced in the September issue.

Send your title on the coupon or make out a similar form on a plain sheet of paper or government postcard.

Awards for May

First Prize — $20

"The electric separator makes the milk man beam,
Since it produces no backache and much more cream."

MRS. C. G. PAGE, R.F.D. 3, Marshall, Mo.

Nine $2.00 Cash Prizes

"The milk separating process a pleasure today.
No worries or drudgery the electric way."
MRS. BESSIE W. HOOVER, R.F.D. 1, Herkimer, N. Y.

"A push of the button, one turn of the machine,
There you have both milk and cream."
MRS. WM. FASICK, R.F.D. 1, Bordentown, N. J.

"Cream separator electrically propelled.
Hard labor for the farmer expelled."
MRS. EVERETT BROWN, R.F.D. 2, Mooreland, Ind.

"Press the button to start the machine,
A whirl of the motor, out comes the cream."
GERTRUDE WHITE, Box 203, Poquonock, Conn.

"Electrically separated milk and cream.
Makes less work, and is twice as clean."
BLANCHE FITCH, Benoit, Wis.

"Saves the milk and saves the cream,
Fulfills the dairy farmer's dream."
MRS. E. E. FITZGERALD, R.F.D. 5, Box 199-A, Roanoke, Va.

"The electric two-way system hits the spot,
For now there's no more dipping off the top."
MRS. IDA PEAPER, R.F.D. 4, Box 639, Indianapolis, Ind.

"Perfect separation is only one chore,
Electricity, expertly will do many more."
HARRY M. RANDEL, R.F.D. Merion Station, Pa.

"The 'Lectric separator best by test.
Just pour the milk, the motor does the rest."
WILLIAM T. FLEMING, R.F.D. 2, Walden, N. Y.

My title for the July Front Cover picture of ELECTRICITY ON THE FARM is.....

.....

.....

.....

(a) Please list the electrical appliances you do not own in the order you plan to purchase them.

1..... 3..... 5.....

2..... 4..... 6.....

My name is..... R.F.D. .....

Post Office..... County.....State..... 7-36

an Electric Motor

(YOUR CHEAPEST AND BEST SERVANT)

THERE are so many jobs on the farm that a portable electric motor can do — cheaper, quicker, and better — that ***it doesn't pay to be without one.*** Investigate at once — they are low in price, cost little to operate.

A portable electric motor hoists hay, grinds feed, saws wood, fills your silo—in fact, it performs any belt job there is to do!

LET A MOTOR-DRIVEN IRRIGATION SYSTEM PROTECT YOUR CROPS AGAINST DROUTH!

These fine big vegetables were grown during a "dry" season. An irrigation system, operated by an electric motor, turned otherwise certain losses into handsome cash profits.

IF you are raising vegetables, small fruits, plants, or flowers for profit—don't run the chance of crop failure because of drouth at the critical growing time.

An electrical irrigation system gives you "rain whenever you need it". Plenty of water for irrigating truck gardens may be pumped from a good well, a stream, spring, or pool. The cost is moderate—installation can be made quickly — and the added profit on your crops will pay for the electricity many times over.

A representative will be glad to analyze your particular irrigation problems.

FOR COMPLETE INFORMATION — SEE

YOUR ELECTRICAL DEALER

— OR, AGRICULTURAL SERVICE DIVISION, WEST PENN POWER CO.

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